

RESPONSE

Support

Applicants have amended claims 1 and 35 to specify that the polyol comprises a polybutylene adipate. Support for these amendments is found in paragraph [0020] of the specification.

Claims 10 and 42 have been amended to make it clear that they refer to one or more additional polyols which may be used in combination with the polybutylene adipate not specified in claims 1 and 35. Support for these amendments is found in the claims themselves as well as the specification.

Claim 13 has been amended by striking item F, as the element involved is already specified in claim 1. Support for amended claim 13 is found in the claim itself.

Applicants have added new claims 43 to 46. Claim 43 depends on claim 1 and further specifies the components used to prepare the thermoplastic polyurethane of the claimed composition. Claim 45 depends on claim 35 and further specifies the components used to prepare the thermoplastic polyurethane composition of the claimed process. Support for these claims is found in claims 1 and 35 as well as the specification. Claims 44 and 46 depend on claims 43 and 45 respectively and specify the mole ratios between the various components. Support for these claims is found in paragraph [0024] of the specification.

Applicants have cancelled claims 14 to 18, 21, 22, 25, 26, 29, 30, 33 and 34.

No other elements of the claims have been changed.

Remarks

The Examiner rejected claims 13-18, 20-22, 24-26, 28-30, and 32-34 under 35 U.S.C. §112, second paragraph for being indefinite.

Applicants have cancelled claims 14-18, 21, 22, 25, 26, 29, 30, 33 and 34, making the rejections to these claims moot.

Claim 13 has been amended by striking the element already included in claim 1 from the list of items in claim 13. Thus, the rejection should be removed from claim 13. Furthermore, claims 20, 24, 28, and 32 depend on claim 13, thus the rejections should be removed from these claims as well.

The Examiner rejected claims 1, 3, 4, 6, 7, 10, 13-39 and 42 under 35 U.S.C. §103(a) as being unpatentable over Ehrlich (US 4379904) in view of van Der wal (US

4980445) and Mao (US 4124572). The Examiner concedes that Ehrlich is silent on the use of polyoxytetramethylene polyols but finds teachings of the use of combinations of polyester diols and polyether diols, including the use of polyoxypropylene-polyoxyethylene glycol, in van Der wal. The Examiner notes that van Der wal and Mao teach the use of their polyurethanes in the manufacture of coated fabrics and conveyor belts. The Examiner finds that Applicants' previous response was insufficient and failed to fully appreciate the teachings of van Der wal in regards to its combination with Ehrlich. Applicants respectfully disagree.

Applicants emphasize that the present claims require the use of poly(tetramethylene ether glycol) (PTMEG) as a co-polyol in combination with a polyester polyol and also requires the use of a co-chain extender that has to be used in combination with a symmetrical chain extender, wherein Applicants have further defined what specific chain extenders and co-chain extenders are covered. When all of these elements are combined, the resulting TPU composition provides unexpected improved results compared to TPU compositions made under identical circumstances except for the removal of the co-polyol and/or the co-chain extender. None of the references, either alone or in combination, teach this combination of multiple elements, let alone that such a combination could result in the improved results demonstrated by Applicants.

The Examiner notes that van Der wal teaches the use of PTMEG and finds that its combination with Ehrlich reaches the Applicants' claims. Applicants point out that the symmetrical chain extender used in combination with a co-chain extender are also elements of the present invention and that it is combination of all of these elements that allows Applicants' to achieve the improved results demonstrated in the specification.

The data in the specification, and the data provided by the attached declaration of Dr. Donald Meltzer, demonstrate the surprising results the present invention provides. Furthermore, that data shows that these results are obtained at least across the entire scope of the present claims.

Specifically, the examples show that the use of a co-polyol in combination with a co-chain extender provide unexpectantly improved results compared to: situations where both the co-polyol and co-chain extender are missing (see Control/Comparative Example 15), situations where the co-polyol is present by the co-chain extender is

missing (see Control/Comparative Examples 6 and 7), and situations where the co-chain extender is present by the co-polyol is missing (see Control/Comparative Examples 1, 4, 8, and 11).

The rest of the limitations in the claims have been added to ensure the claims are commensurate in scope with the data provided in the specification. Applicants believe the improved performance extends well beyond the scope of the current claims but given the data in the specification Applicants have narrowed the claims around the inventive examples so that there is not doubt the improved performance is present at least across the scope of the current claims. For example, the current claims have been amended to limit the polyester polyol to polybutylene adipate, the polyol used in the examples provided.

Thus, Applicants respectfully submit that the present claims are both novel and non-obvious over the cited references due to the surprising results demonstrated in the specification and the declaration accompanying this response. Applicants ask that the current rejections be removed.

If the Examiner still feels the combination of the cited references reaches the present claims, Applicants ask for additional clarification on where the combination of references teaches that a combination of a polyol and a PTMEG co-polyol and a combination of a symmetrical chain-extender with a co-chain extender, would result in TPU composition with the improved performance demonstrated by Applicants.

Conclusion.

For the foregoing reasons, it is submitted that the present claims are novel and unobvious over the cited reference, and in condition for allowance. The foregoing remarks are believed to be a full and complete response to the outstanding Office Action. Therefore, an early and favorable reconsideration is respectfully requested. If the Examiner believes that only minor issues remain to be resolved, a telephone call to the Undersigned is suggested.

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July 8, 2010
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Any required fees or any deficiency or overpayment in fees should be charged or credited to Deposit Account 50-1501 (The Lubrizol Corporation).

Respectfully submitted,

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